

## **ELECTRIC SENSORY DEVICE**

### **Field of the Invention**

5           This invention relates to a sensory apparatus and system and more particularly to an apparatus and system for emitting light, sound and/or fragrance. Priority is claimed based on provisional applications Serial No. 60/262,190, filed January 17, 2001, and Serial No. 60/295,044 filed June 1, 2001.

### **Background of the Invention**

10           Consumers are continually seeking out small devices to enhance their lifestyles and personalize their homes. Thus, plug-in devices for emitting fragrance, for reducing household odors, or for emitting sound and light are known in the art. For example, one category of devices emits a fragrance into the surrounding area when connected to an electrical outlet. U.S. Pat. No. 5,647,053 discloses such a device, where a fragrant  
15           liquid is held within a container and vaporized into the surrounding area via the heat generated from an electrical heater. A light emitting device is shown in U.S. Pat. No. 4,912,609, which describes a conventional type night light that emits a low-level illumination to the surrounding area. U.S. Pat. Nos. 4,549,250 and 4,714,984 disclose night lights with a window to illuminate a picture, such as a flower. On the back of the  
20           picture is a fragrant pad containing a liquid that when heated by a light bulb contained within the device, vaporizes and is emitted into the surrounding area. U.S. Pat. No. 4,816,973 discloses a portable night light and air freshener that propels freshening media into the surrounding area via a rotating fan. U.S. Pat. No. 4,349,059 discloses a plug-in illuminating device combined together with a liquid fragrance container in a  
25           decorative housing. In this device, the light illuminates when connected to an electrical

outlet and the fragrance is released when the user depresses a designated portion of the cover to aromatize the fragrant vapor into the surrounding area. Other light emitting devices are also known in the art. For example, U.S. Pat. No. 5,253,000 describes a plug-in device that projects images onto a wall or flat surface.

5 The prior art also includes devices for providing music or other sounds for babies that can be attached to a crib. For example, U.S. Pat. No. 5,991,131 discloses a crib light with a tape player. Others include crib lights and the use of sound recordings to provide soothing sounds. None of these sound and light devices appear to include a fragrance feature and all appear to be battery operated.

10 No plug-in device is known to applicant that combines light, fragrance, and sound in a single unit. Nor is applicant aware of a plug-in system that combines sound and fragrance. Thus, consumers currently searching for fragrance, light and sound emitting plug-in devices will at the very least have to purchase two separate devices in order to meet their needs. The present device conveniently packages, in one device, light,  
15 sound and fragrance features.

Thus, an object of this invention is to provide a plug-in system contained in a single unit that preferably emits fragrance, light and/or sound.

Another object of the invention is to provide a multifunction versatile sound, light and fragrance system that includes features and means for creating a wide variety of  
20 exterior decorative choices or appearances.

Yet another object of the invention is to provide multiple combinations of light, sound and/or fragrance systems in a single device to accommodate the different needs and desires of the user.

### Summary of the Invention

In keeping with one aspect of the invention, a device or an apparatus for emitting light, sound and fragrance is provided. The device contains a housing with perforations, permeable membranes and/or translucent coverings along its walls and/or body to allow  
5 for the transmission of light, sound and fragrance when the device is activated. The device includes a conventional plug for connecting it to a power source, which enables all three systems. This plug may be pivotable to allow the system to be used with vertical or horizontal electrical outlets. The light source is mounted in the housing and may include an incandescent or fluorescent bulb, or an electro-luminescence or light  
10 emitting diode (LED) and may function as a focused light, a backlight for a screen, or as a projected light.

The sound system is also mounted in the housing and includes an audio speaker, an amplifier and means, such as a sound chip or cartridge which transmits prerecorded sound through the speaker to the surrounding area. The sound  
15 transmitting means is attached to a circuit board which in turn is connected to the amplifier and the speaker, all within the housing of the device. The sound transmitting means may be permanently attached to the circuit board or removable so that the user can interchange sound chips or cartridges. When an audio cartridge system is employed, the cartridges are interchangeable so that the user may vary sounds or  
20 music as desired. The cartridges are preferably insertable into a receptacle located within the housing and are preferably accessible to the user from outside the housing of the device.

The device includes a fragrance container that is adapted to be mounted on or within the housing. The fragrance may be contained in the receptacle in the form of a liquid mixture, saturated pads, beads, gel packs or a spray. An electrical warmer located within the housing provides heat necessary to cause the fragrance to vaporize. Alternatively, the light source may provide the necessary heat. The fragrant vapor is emitted to the surrounding area through perforations, vents or permeable membranes located on or in the walls of the housing.

System control switches may be provided to actuate independently each of the system components, and the system may include a timer to operate the device for predetermined time periods. Means may be provided to allow the user to control the amount of light, sound and/or fragrance emanating from the respective component. In this way, the user has greater control over the amount of light, sound or fragrance emitted from the system and device during use. A turbine may be attached to the housing, such that when the device is activated, the heat produced by the light source causes the turbine to rotate and project images on a translucent screen or into the surrounding area through a translucent screen. Where desired and appropriate, a battery, rather than typical AC power, may be used as the power source.

Also, a motion and/or light detector may be mounted within the housing with suitable means to detect movement or change in light brightness in order automatically to activate or shut off the system or various features of the system. Where desired, sensors may be included within the system for activating the device via an external remote control or transponder.

### Brief Description of the Drawings

Fig. 1 is a front perspective view of one embodiment of this invention;

Fig. 2 is a perspective view of the back of the embodiment of Fig. 1;

Fig. 3 is a cross section taken along line 3-3 of Figs. 1 and 2;

Fig. 4 is a partially exploded side elevational view of the embodiment of Fig. 1;

Fig. 5 is a cross section taken along line 5-5 of Fig. 4;

Fig. 6 is a partial plan view of the embodiment of Fig. 1 illustrating the insertion of a sound cartridge into a holder;

Fig. 7 is a partial plan view of a second embodiment of the invention;

Fig. 8 is an exploded perspective view of another embodiment of the invention;

Fig. 9 is a partial plan view of the embodiment of Fig. 8 with an alternative arrangement for the fragrance system;

Fig. 10 is a partial plan view of the embodiment of Fig. 8, with the screen cover removed; and

Fig. 11 is a schematic view of the rooms of a house illustrating the use of the system in the various rooms.

### Detailed Description of the Preferred Embodiment

Referring to the drawings, Figs. 1 and 2 show the inventive device **20** capable of being plugged into an electrical outlet (not shown) on a wall **22**. The device **20** consists of a housing **24** and a plug **26** (Fig. 2). The housing **24** contains a lighting system **28**, a sound system **30** and a fragrance system **32**, as illustrated in Fig. 3. The housing **24** further comprises a face plate **34** mounted thereon, which in the illustrated embodiment,

resembles a stone wall and has translucent areas **36, 38** which transmit and diffuse light, a plurality of perforations **40** in the wall **42** of the housing **24**, an opening **44** and a vent **46**. The housing **24** may further contain a recessed area **48** that is adapted to contain images or other graphic designs.

5        Areas **50, 52** on the housing **24**, may be frosted, opaque or perhaps a satin background designed to enhance a display of the translucent areas **36, 38** and the design used in the recessed area **48**. An optical or infrared sensor **54** may be provided in the housing **24** to control the device **20** from a remote location. The remote controller (not shown) would transmit infrared light to the sensor **54**, which then transmits signals  
10 to an electronic circuit that activates the device **20**. The optical sensor **54** may also be designed to detect either movement in a room or a dimming of ambient light or both. This feature would be of interest when the device **20** is used as a night light to indicate when people are entering the proximity of the device. A switch **56** may be used to manually switch the device **20** on and off or to override the control signals produced via  
15 the optical sensor **54**. The switch **56** may also be designed to operate independently for each of the functions of the device **20**.

Referring to Fig. 2, the plug **26** includes contact blades **58**, which may be rotatable so as to enable the device **20** to be mounted either horizontally or vertically to a wall outlet (not shown). The device **20** can be powered by a battery (not shown).

20        As shown in Fig. 3, the lighting system **28** consists of a light source **60** that can be mounted within the housing **24**, as shown, or attached to the outside of the housing **24**. The light source **60**, which are illustrated as light-emitting diodes, is connected to the circuit board **62** through wiring **61**. The light source **60** is located within the housing

**24** adjacent to the translucent areas **36, 38**, so that the emitted light flows through the areas **36, 38** to the surrounding area. The light source **60** can include other means than light-emitting diodes, such as e.g. an incandescent lamp, and may emit a constant stream of light or a strobe as desired. As will be seen, the light source **60** may also serve to project images on the device or to the surrounding area and serve as a heat source for the fragrance emission.

The sound system **30** shown in Fig. 3, comprises a circuit board **62**, at least one sound chip (not shown), an amplifier (not shown) and a speaker **64**. The circuit board **62** is mounted in the housing **24** and electrically connected through wiring **55** to the switch **56**, which in turn is connected to the plug **26**. The sound chip mounted on the circuit board **62** is electrically connected to the speaker **64** through wiring **65**. A generally U-shaped member **68** extends outwardly from the back part of the housing **24** (Fig. 2). Member **68** acts as a spacer when the device **20** is plugged into a wall outlet and provides an open area for sound waves to escape from the space created by member **68** and the back of the housing **24**. Member **68** also helps to stabilize the device **20** when it is plugged into a wall outlet and provides a more attractive appearance to the device.

As shown in Figs. 3 and 4, the fragrance system **32** consists of a warmer **94** and a container **96** with a neck **98** and a wick **100**. The warmer **94** is a self-activating system contained within the housing **24** that encircles the neck **98** when the container **96** is inserted into the housing **24**. The container **96** is removably attached to the housing **24** and contains a liquid fragrance. In this embodiment, the wick **100** extends into the liquid fragrance in order to draw the fragrance from inside the container **96** to be

vaporized by heat from the warmer **94**. The wick **100** continues upward through the container **96** and out the neck **98**. The neck **98** of the container **96** is threaded so that a cap **102** (Fig. 4) may close it when not in use.

When a fragrance is desired, the container **96** is inserted into the opening **44** in the housing **24**. To assist the insertion and retention of the container **96**, a passage (not shown) lies adjacent to the opening **44** (Fig. 3). In positioning the container **96**, the passage has vertically extending guides **104**, **106**, **108** (Fig. 5) molded in its sidewalls. The container **96** contains grooves **103**, **105**, **107**, shown in Fig. 5, that cooperate with the guides **104**, **106**, **108** to aid in holding the container **96** in the housing **24** during operation. Flexible fingers **110**, **112** attached to the housing **24** contact the neck **98** to further aid in the retention of the container **96**.

When the user inserts the plug **26** into an electrical power source (not shown), electric current flows through the device **20** and activates the lighting system **28**, the sound system **30** and the fragrance system **32**, simultaneously. In the lighting system **28**, electric current powers the light source **60** and light is emitted through the translucent areas **36**, **38** into the surrounding area. If the light source **60** is attached to the external portion of the housing **24**, light will be emitted directly to the surrounding area without the need to pass through the translucent areas **36**, **38**.

Simultaneously with activation of the light system, the circuit board **62** of the sound system **30** is electrically activated causing the sound chip to transmit electrical data to the speaker **64**. The speaker **64** then transmits the data as sound through the perforations **40** to the surrounding area. Similarly, in an alternative embodiment shown in Fig. 6, the user may insert a separate sound cartridge **66** into the receptacle **70** of the



housing **24** in lieu of the sound chip in device **20**. This embodiment permits the user to interchange sound cartridges **66** as desired. Preferably, the system should be designed to permit the cartridge **66** to be inserted into the receptacle **70**, so that the cartridge label is visible to the consumer even when the cartridge **66** is mounted in the device **20**.

5 Together with the light and sound system, the warmer **94** of the fragrance system **32** is activated, causing it to produce and radiate heat. When the container **96** is inserted into the opening **44**, the wick **100** is exposed to the warmer **94**, and the heat radiating from the warmer **94** vaporizes the oil on the wick **100**. The vapor escapes through the vent **46** in the wall or top portion of the housing **24** and is emitted to the surrounding area (Fig. 3). If desired, the light source may be used as the warmer for the fragrance system **32**.

10 Fig. 7 shows an alternative embodiment **80**, which additionally includes an outer dome **82** with at least one window **83** which may be clear, tinted or contain an image for projection. The dome **82** lies adjacent to the housing **24** and a wheel **87**. An inner dome **89** rests inside the outer dome **82** and contains a translucent film (not shown) that may contain graphics or other images. The inner dome **89** is connected to the wheel **87** such that when the wheel **87** is turned, the inner dome **89** rotates with the wheel **87**. As the inner dome **89** rotates, the images contained on the film pass beneath the window **83**, such that when the light source **60** is activated the images are projected into the surrounding area. Additional windows **83** may be added.

15 In this embodiment, the fragrance system **32** consists of a gel pack **114** and heating element (not shown). When the system **32** is activated, the heating element warms the gel pack **114** causing it to release fragrant vapor into the surrounding area.

Simultaneously, the light source **60** transmits light through the image window **83** within the dome **80** and projects the images into the proximate area. The sound system **30** transmits sound, as described in the previous embodiments.

Fig. 8 shows a further embodiment **84** including turbine **85**, a translucent screen **86**, and a light source **60**. The screen **86** fits over the light source **60** and rests in a groove (not shown) on the housing. The screen **86** is made of a translucent or transparent material and may contain various images for projection. The turbine **85**, connected to and positioned above the screen **86**, balances on a rod **88**, which extends the length of the screen **86**. The heat produced from the light source **60** causes the turbine **85** and screen **86** to rotate, illuminating the images contained on the translucent screen **86** and in some instances projects the images to the surrounding area.

Fig. 8 contains a similar fragrance system **32** as shown in Fig. 7. However, when the lighting system **28** is activated in this embodiment, the light source **60** generates sufficient heat to cause the turbine **85** to rotate. As the turbine **85** rotates, images contained on screen **86** are illuminated or projected to the surrounding area. Similarly, Fig. 9 illustrates an alternative arrangement of the device, with the fragrance system **32** disposed adjacent to the light source **60**.

Similarly, Fig. 10 contains a turbine **85**, rod **88** and translucent screen **86**. However, in this embodiment a removable transparent shade **90** is mounted over screen **86** and rests in a groove **92** around the light source **60**. The turbine **85** is connected to the screen **86**, which rotates with the turbine **85** while the shade **90** remains stationary. When the light source **60** is activated, the heat produced causes the turbine **85** to rotate. Images contained on the rotating screen **86** are projected onto

the shade **90** and cause the images to appear to move across the shade **90**. Individual switches **56** may be employed to actuate the lighting, sound and fragrance systems individually. Perforations **40** in the housing **24** provide an outlet for sound and vents **41**, provide outlets for the fragrance.

5           Devices can be designed for use in some or all rooms of a house. This is illustrated in Fig. 11. Each room could employ its own device to emit appropriate sound, fragrance and light to accommodate the function of that room. If the device is intended for a baby's room, for example, the recessed area **48** could contain a moon design, which dimly glows, with the sound system playing lullabies to lull the baby to sleep and  
10           a soothing eucalyptus fragrance emitted from the fragrance system. Similarly, if the device is intended for a dining room, a soft light may be employed, with classical music and a light fragrance conducive to an eating environment. Placed in a teenager's room, the device may project moving images on the walls of a room while playing rock music and emitting a playful tangerine fragrance. Any number of other themes could be  
15           employed, depending on the intended use of the device, as illustrated, for example, in Fig. 11.

It will be understood that, in some instances, modifications of the system may be made without departing from the spirit and scope of the invention. For example, the sound and fragrance features may be combined without the lighting function. Likewise,  
20           other combinations of two or more of the systems of the invention may be appropriate. Also, other modifications of the invention will be evident to a person with skill in the art. It is the intention of the following claims to include such modifications.